

- a) a vessel for holding seed crystal therein with precursor charge or melt thereon,
- b) means for installing said seed crystal and said charge in said vessel,
- c) a small inner elongated electrode mounted within said vessel at or near the vertical axis thereof, which electrode extends into said charge or melt but does not contact said crystal,
- d) an outer electrode which extends at least partially around said inner electrode, and proximate the inner walls of said vessel,
- e) heater means to heat said charge to a molten state to form a melt,
- f) means for applying a voltage across said electrodes to generate a radial current in said melt,
- g) an induction coil mounted around the vessel and
- h) means for applying voltage to said coil to impose a magnetic field in said melt and to impart a stirring force to said melt for greater uniformity in melt and crystal.

12 (*previously presented*): The apparatus of claim 11 wherein said vessel walls serve as said outer electrode.

13 (*previously presented*): The apparatus of claim 11 wherein said coil serves as said heater means and said induction coil.

14 (*previously presented*): The apparatus of claim 11 wherein said small electrode is mounted in a heater housing, which housing is sized to leave one or more annular spaces between it and the inner walls of said outer electrode, said housing having an inside heater near the inside bottom surface of said housing, means for lowering said housing so it sits on said charge in a lower portion of said vessel, means to activate said inside heater to heat said charge to a lower melt, a reservoir mounted in the upper portion of the vessel for holding an upper charge to supply an

upper melt which can flow down through said annular spaces and around said heater housing to contact said lower melt and thus submerge a portion of said housing in said melt, means to heat said upper charge to said upper melt and means for applying voltage to said electrodes and said induction coil to impart a stirring force to said lower melt for greater uniformity in melt and crystal.

15 (*previously presented*): The apparatus of claim 14 having means to ramp down the heat applied to said lower melt and means to slowly raise said inner heater and heater housing in advance of crystal growth below, in the bestirred lower melt, to provide a more uniform radial composition both in said melt and crystal while replenishing said lower melt from said upper melt through said annular spaces.

16 (*previously presented*): A more uniform semiconductor crystal comprising one made by,

- a) loading a vessel in its lower portion with a seed crystal,
- b) adding a precursor charge thereon in said vessel,
- c) heating said charge to a molten state, to form a melt,
- d) electromagnetically stirring said melt to form a more uniform composition melt over said seed crystal and
- f) slowly reducing the temperature of said melt over said seed to grow said crystal.

17 (*previously presented*): The crystal of claim 16 wherein a vertical magnetic field is induced in said vessel and an electric field is applied orthogonally to said magnetic field in such a manner that a rotational stirring of the melt results.

18 (*new*): The crystal of claim 16 being of low defect density and being IR transparent.

19 (*new*): The crystal of claim 18 being of GaSb.